
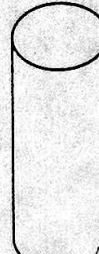
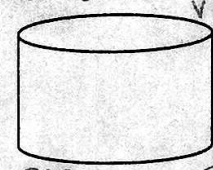
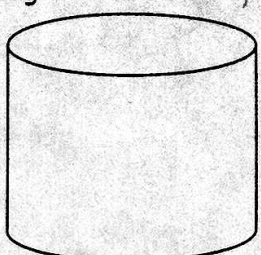
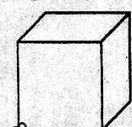
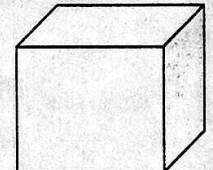
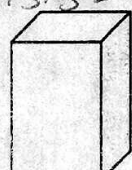
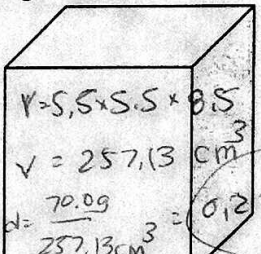
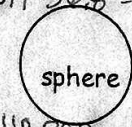
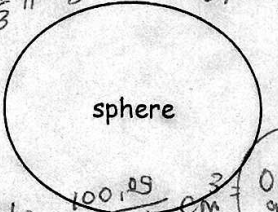
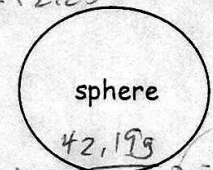
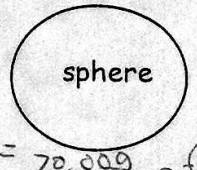


Density Ranking Worksheet
DSHS

Name KEY
Per _____ Date _____

<p>A. Mass = 110.00 g Volume of water (initial) = 20.0 mL (final) = 65.0 mL</p>  <p>$V = 65 - 20 = 45 \text{ mL}$ $d = \frac{110.0 \text{ g}}{45} = 2.44 \frac{\text{g}}{\text{mL}}$</p>	<p>B. Mass = 169.90 g Diameter = 3.0 cm Height = 8.5 cm</p>  <p>$V = \pi (1.5^2) 8.5 = 60.05 \text{ cm}^3$ $d = \frac{169.90 \text{ g}}{60.05 \text{ cm}^3} = 2.83 \frac{\text{g}}{\text{cm}^3}$</p>	<p>C. Mass = 20.00 g Diameter = 4.5 cm Height = 5.5 cm</p>  <p>$V = \pi (2.25^2) 5.5 = 349.71 \text{ cm}^3$ $d = \frac{20.0 \text{ g}}{349.71 \text{ cm}^3} = 0.19 \frac{\text{g}}{\text{cm}^3}$</p>	<p>D. $V = \pi \cdot 3^2 \cdot 7 = 197.82 \text{ cm}^3$ Mass = 210.00 g Diameter = 6.0 cm Height = 7.0 cm</p>  <p>$d = \frac{210.00 \text{ g}}{197.82 \text{ cm}^3} = 1.06 \frac{\text{g}}{\text{cm}^3}$</p>
<p>E. Mass = 30.15 g Volume of water (initial) = 14.6 mL (final) = 48.1 mL</p>  <p>$V = 48.1 - 14.6 = 33.5 \text{ mL}$ $d = \frac{30.15 \text{ g}}{33.5 \text{ mL}} = 0.9 \frac{\text{g}}{\text{mL}}$</p>	<p>F. Mass = 190.00 g Length = 4.5 cm Width = 5.0 cm Height = 4.5 cm</p>  <p>$V = 4.5 \times 4.5 \times 5.0 = 101.25 \text{ cm}^3$ $d = \frac{190.00 \text{ g}}{101.25 \text{ cm}^3} = 1.88 \frac{\text{g}}{\text{cm}^3}$</p>	<p>G. Mass = 20.00 g Length = 3.0 cm Width = 3.0 cm Height = 5.0 cm</p>  <p>$V = 3 \cdot 3 \cdot 5 = 45 \text{ cm}^3$ $d = \frac{20.0 \text{ g}}{45 \text{ cm}^3} = 0.44 \frac{\text{g}}{\text{cm}^3}$</p>	<p>H. Mass = 70.00 g Length = 5.5 cm Width = 5.5 cm Height = 8.5 cm</p>  <p>$V = 5.5 \times 5.5 \times 8.5 = 257.13 \text{ cm}^3$ $d = \frac{70.0 \text{ g}}{257.13 \text{ cm}^3} = 0.27 \frac{\text{g}}{\text{cm}^3}$</p>
<p>I. Mass = 110.00 g Volume of water (initial) = 36.8 mL (final) = 50.9 mL</p>  <p>$V = 50.9 - 36.8 = 14.1 \text{ mL}$ $d = \frac{110.00 \text{ g}}{14.1 \text{ mL}} = 7.8 \frac{\text{g}}{\text{mL}}$</p>	<p>J. Mass = 100.00 g Diameter = 6.0 cm</p>  <p>$\frac{4}{3} \pi \cdot 3^2 = 238.64 \text{ cm}^3$ $d = \frac{100.00 \text{ g}}{238.64 \text{ cm}^3} = 0.42 \frac{\text{g}}{\text{cm}^3}$</p>	<p>K. Mass = 42.19 g Diameter = 4.5 cm</p>  <p>$\frac{4}{3} \pi \cdot 2.25^3 = 47.7 \text{ cm}^3$ $d = \frac{42.19 \text{ g}}{47.7 \text{ cm}^3} = 0.88 \frac{\text{g}}{\text{cm}^3}$</p>	<p>L. Mass = 70.00 g Diameter = 4.0 cm</p>  <p>$\frac{4}{3} \pi \cdot 2^3 = 33.49 \text{ cm}^3$ $d = \frac{70.00 \text{ g}}{33.49 \text{ cm}^3} = 2.09 \frac{\text{g}}{\text{cm}^3}$</p>

Ranking: Each of the situations above show a piece of material and data that students were able to collect on the material. Place the situations in order. If two materials are equal, indicate this with an equal sign.

ALL RANKINGS SHOULD BE FROM LEAST TO GREATEST

Density: C H J G K E D F L A B I

Mass: C G E K H L J A I B F D

Volume: I L E A G K B F D J H C

Things could be worse...

As a result of a physics experiment gone terribly wrong, you are stranded on an isolated island in the middle of Lake Strange. As its name would indicate, Lake Strange is unusual because the lake is made of three different liquid substances. The liquid substances are separated into layers. The three substances appear to have always been separated into layers and, since storms do not strike Lake Strange, they will probably always remain separated.

As expected, you would like to get off of the island. Unfortunately, there is no land in sight and you need to prepare for a few days or weeks on the lake. Fortunately, you do have some information at your disposal. You know the densities of the liquid substances that make up the lake. They have densities of 1.1 g/mL, 0.9 g/mL, and 0.8 g/mL. While you are not sure of the names of the substances, you do know that they are harmless to humans.

As is always the case with deserted island situations, you have some resources at your disposal. In fact, you have objects A through L on the previous page and plenty of rope. You decide to attempt an escape across the lake. Using the resources available, decide (1) which material to tie together to create a raft, (2) which material to tie to a rope to create an anchor, and (3) which material to use to create a fish trap that will float in the middle of the liquid column.

Before you launch your boat, you decide to leave behind a list of the materials that you used to build the boat, anchor, and trap. In addition, you leave a diagram of the lake, with the layers labeled. On your diagram, you include an image of your boat, anchor, and trap at their appropriate places in the lake. Bon voyage!

1 - RAFT - C H J G

2 - ANCHOR - F L A B I

3 - NET - K E D

B

...or better.

Upon your return to land, you admire the quality of the raft you created. You are so impressed that you decide to bring it home to float around the local pond. What do you predict will be the results of trying to float your raft around the local pond??

C H J G K E WILL FLOAT

D F L A B I WILL SINK